ASTRI perception and high-precision positioning technology provides consolidated indoor/outdoor vehicle/human positioning with low latency. It is an infrastructure technology that lays the cornerstone for C-V2X, smart-city, smart-mobility, and Automated Guided Vehicle (AGV) applications.

Keywords:
- Visual Positioning, Smart City, Sensor Calibration, Smart Mobility, Smart Surveillance, C-V2X, Smart Parking, Automated Guided Vehicle, AGV, Edge Computing, Advanced Driver Assistance Systems, ADAS, 5G, Robot, SLAM

Problems addressed

- Too costly to install high-precision positioning devices (e.g., RTK device) on all vehicles/humans to obtain its accurate position
- Impossible/hard to obtain accurate position in indoor and urban area due to lack of or poor Global Navigation Satellite System (GNSS) signal
- No solution to obtain all objects (vehicles/humans) in an area for road safety/smart transportation purposes
- No consolidated indoor/outdoor positioning solution

In urban and indoor area, traditional GNSS positioning system cannot provide high-precision positioning of vehicles or humans. ASTRI's perception and high-precision positioning technology provides an end-to-end solution with high precision/low latency/large-scale coverage/easy-to-deploy. It is a patented technology and outperforms other competitors in a few open contests.

Innovations

ASTRI's visual positioning and perception technology leverages multi-sensor fusion technologies and GPU-accelerated AI algorithms to achieve a high precision and high speed, providing consolidated accurate positioning for objects in indoor/outdoor area.

The innovation outline:
- **Visual positioning,** leveraging the widely deployed cameras in smart city/smart parking/smart surveillance to achieve high-precision position information of high-speed moving vehicles or humans at long distance (20cm in 150m, 0.5m at 400m)
- **Innovative camera calibration** technology enables mass deployment and leverages already-mounted cameras for new applications
- **Multi-sensor Fusion Perception** offers flexible combinations of a variety of sensors like camera/lidar/radar, to obtain even higher precision and even lower latency
- **GPU-accelerated** AI algorithm to achieve real-time positioning, saving resources
- **Positioning technologies in complex environments** such as rainy/ snowy/smoggy weather, and for protecting user's privacy

Key impact

- The technology can be used in many positioning-demanded scenarios such as C-V2X, smart-city, road-side perception for smart-intersection, etc.
- AI is adopted for optimizing positioning accuracy
- Consolidated indoor/outdoor positioning provides a better solution for self-localization problem for AGV, autonomous mobile robots (AMRs) and Autonomous Driving

Innovation snapshot
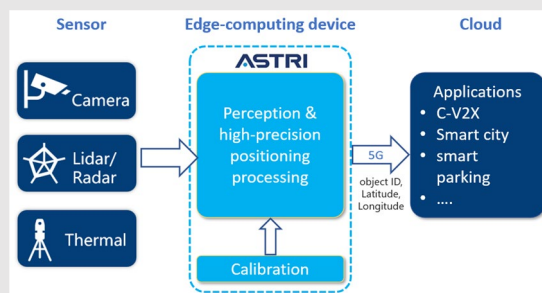
Project completed

- Ongoing

Applications

- C-V2X
- Smart Surveillance
- Smart City
- Smart Transportation
- AGV

Patent(s)

- US App. No. 17/467,664 and CN App. No. 202180002817.0
- US App. No. 17/467,683 and CN App. No. 202180002846.7

ASTRI Patent Search

Commercialisation opportunities

- IP licensing
- Technology co-development